

# CHAPTER I

## INTRODUCTION

### 1.1. Background

Learning is a working process which is done by someone to gain a new change of behavior completely as the result of experience itself in interaction with the environment. Teaching is a professional activity that requires high level skills. Today more teachers are required as manager for teaching and learning process that perform four different tasks, they are planning, organizing, directing and evaluating because students' success is measured based upon achievement of competence of teaching and learning established since beginning of the learning activities. It means teacher's role is very important in learning process. The teachers act as facilitators, mediators and counselors.

The other responsibility of the class teacher is to help students attain maximum achievement in their learning tasks. Several competences are expected of the teacher in order to achieve this goal. One of the competencies is teachers' ability using appropriate instruction strategies. Chemistry as branch of science is highly important in modern societies because of its requirements as a prerequisite to the study of many other science oriented courses. It thus appears that for a nation to develop science and technology, teaching and learning chemistry needs to improve. It is therefore that performances in chemistry and in science generally should be of high grades. (Aluko, 2008:32)

Chemistry is one of the most important subjects to be understood by students that has an important role in the development of technology and everyday life. Chemistry itself is composed of many materials and concepts that are interconnected with each other. But apparently the result of observation of students' understanding in chemistry topics is still low, it seen from the results of interviews and observations during the researcher running the PPL (Experience Field Program) in SMA N 2

Kisaran and the observation in SMA N 16 Medan which will be the aim of researcher.

The student considers that chemistry is hard to understand, complicated, too much rote, a lot of material, dull and uninterested. From that, seen that a gap between teachers and students, the teacher as a teacher only to deliver the material without seeing aspects of the students, such as interest, understanding, difficulty, and so forth. And from the students, they see the teacher as an addition to the burden for them, even as the enemy. Of course students do not have a strong interest and motivation to learn the material being taught, so do not be surprised if they have low achievement of chores and daily tests. According to Bandura (1988) in Bobby De Porter (1999) "The Beliefs of someone about his/her ability was very influential on the ability itself."

That condition above demands hard work from various parties, especially the teachers as educators who deal directly with students. Teachers are required in designing creative learning process, the selection of learning resources, media and learning methods that appropriate to the topic being taught. This is supported by Sagala (2003) that "Teachers should be able to maintain student interest in learning, steady their motivation and lead the process of learning occurs naturally follow from the experience. So that teachers have to be wise and creative in determining the appropriate model for learning, so that learning process can take place effectively and efficiently ". Thus the thing that we often encounter in which the students as a generation of country feel very tired, not interested, and under estimate in chemical class can be overcome.

There are several attempts through the use of planned instruction strategies and models to improve the status of chemistry teaching and learning achievements. One of them teachers should be known to teach the learning material by used method combined with media compatible. The teachers need to be more creative and innovative in teaching, especially in learning chemistry topic. (Oemar Hamalik, 2008). Without creativity and innovation it is just make decreases of students' interest

inquired for the material being taught and understand it. It means, teacher should keep student's interest and motivate to learn in different ways of teaching, using varies teaching method combined with teaching media or another learning method in improving students achievements and motivations.

Meanwhile, Some schools in Indonesia will start to use curriculum 2013 which is the teaching and learning that suggested by Indonesia government just according three kinds of teaching and learning method. They are problem based learning, project based learning and discovery. Since the education of character in curriculum 2013 aims to increase the quality of learning process and result that leads to the forming of student's good behavior and morality completely, integrated and balanced which suitable with the standard competences of graduation at any educational institution. Through the implementation of curriculum 2013 that based on competence and character with thematic and contextual approach is expected students are able increase and use their knowledge independently, assessed, internalization and personalization the character value and morality so that manifest to daily life.(Mulyasa, 2013)

Gallagher et al (1995) said that PBL is able and need to include experiment as a tool to solve problem. Problem based learning has been used by experts in chemistry learning and its derivations such as biochemistry by Dods (1996), learning complex chemical synthesise of natural products by Cannon and Krow (1998), Yu Ying (2003) in electrochemistry learning and Liu Yu (2004) in analytical chemistry learning. (Ngalimun, 2014)

According to Ward (2002) and Stepien (1993) Problem Based Learning (PBL) is one of innovative learning that able to give active learning condition to students. PBL is one of learning model that involve students to solve a problem through some steps of scientific method so that students can learn the knowledge that relate with the problem and at the same time, have skill to solve the problem. Then Fogarty (1997) stated that PBL is an instruction approach by making confrontation to the students

with simple problem, formed *ill-structured*, or *open ended* through stimulation in learning. (Ngalimun, 2014)

In model problem based learning can use learning media as helping tools in learning and teaching process. Through learning media, teacher can give subject matter which is abstract become concrete so that it is easy to be understand by students and able to vanish verbalism. (Wina Sanjaya: 2009)

Hydrocarbon is one of the ranges of chemical studied in organic chemistry. It is one of main subject that important to learn because the concepts in hydrocarbon topic will still be used as a basic to learn the next matter that is petroleum and have related with organic chemistry in third class of high school second semester. Therefore, it needs an easy way, interesting and effective to deliver hydrocarbon topic by involving students using appropriate methods and media. (Fadhilah, 2013) Hydrocarbon which is abstract can be understood easily if this matter is explained through media. One of the media that can be used to make students easily to comprehend for abstract concept is a molecular model or *molymod*.

Molymod is a tool to illustrate the shape of a molecule. It usually made of plastic in form of balls that connected by a bars. The balls are as atom of an element meanwhile the bars is as the bonding of the elements. The balls have different color to difference the types of atom and the position of atom which one is as central and which one is as bonding atom. Molymod can overhaul according to the shape of the molecule that is desired. Molymod has been proved that able to increase the students' comprehension to the concept which related with molecule. (Septiani, 2009)

In fact, the prices of molymod which is able to make students more comprehend in hydrocarbon topic is not cheap and difficult to buy because it doesn't sell commercially in shop or book store. Plasticine as one of media can be used to submitte molymod. Beside the prices are cheaper than the real molymod, it is easy to buy and get because it sells commercially. According Well Mina (2012) Plasticine is clay that is used to by children to play and can be used repeatedly because it will not

be solidify. Plasticine is included to clay and it usually sell in store toy with is colorful and easy to form. (Rochayah, 2012)

Based on the discussion above, the researcher would like to investigate the **“Effect of Problem Based Learning Using Molymod Made of Plasticine Towards Improving Senior High School Students’ Achievement in The Hydrocarbon Topic.**

### **1.2. Problem Identification:**

Based on the background above, there are many problems identified:

1. The teaching and learning process in chemistry especially in hydrocarbon topic does not grow any enthusiasm of students.
2. Generally teachers do not use problem based learning model in teaching and learning process of chemistry topic
3. Generally teacher do not used molymod made of plasticine in teaching and learning process
4. How the improving of student’s achievement using problem based learning combined molymod made of plasticine and without problem based learning.

### **1.3. The Scope of Problems**

In this study, the problem is limited to scope:

1. Effect of problem based learning using molymod made of plasticine towards improving senior high school student’s achievement in hydrocarbon topic
2. Improving students achievement of hydrocarbon concepts acquired individually through pre test and post test.

### **1.4. The Problem of the research**

Based on the identification of problems and limitation described above which a research problem in this study are:

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1. Is the student's achievement taught by using problem based learning model higher than direct instruction which both use molymod made of plasticine in hydrocarbon topic?

### **1.5. Research Objectives**

Based on the problem statement above, the objective in this research are :

1. Knowing the students' achievement which is taught by using problem based learning model higher than direct instruction which both of them using molymod made of plasticine in the hydrocarbon topic.

### **1.6. Research Significance**

The significances of this research are:

1. Improving the students achievement taught hydrocarbon material
2. The results are expected used by the teachers as information or literature to improve teaching methods combined with molymod made of plasticine media in chemistry learning.
3. As a reference for the researcher to apply the appropriate learning strategy in teaching and learning activities in schools, especially by using problem based learning combined molymod made of plasticine media and as a reference for the further research.

### **1.7. Operational Definition**

1. Problem Based Learning

Problem Based Learning (PBL) is one of innovative learning that able to give active learning condition to students. PBL is one of learning model that involve students to solve a problem through some steps of scientific method

so that students can learn the knowledge that relate with the problem and at the same time, have skill to solve the problem.(Ngalimun, 2014)

## 2. Molymod Media

Molymod is a tools to illustrate the shape of a molecules. It usually made of plastic in form of balls that connected by a bars. The balls are as atom of an element meanwhile the bars is as the bonding of the elements. The balls have different color to difference the types of atom and the position of atom which one is as central and which one is as bonding atom. Molymod can overhaul according to the shape of the molecule that is desired. Molymod has been proved that able to increase the students' comprehension to the concept which related with molecule. (Septiani, 2009)

## 3. Plasticine

According Well Mina (2012) Plasticine is clay that is used to by children to play and can be used repeatedly because it will not be solidify. Plasticine is include to clay and it usually sell in store toy with is colorful and easy to form. (Rochayah, 2012)

## 4. Hydrocarbon

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